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(21)(A1) 2,272,497
(22) 1999/05/19
(43) 1999/12/08

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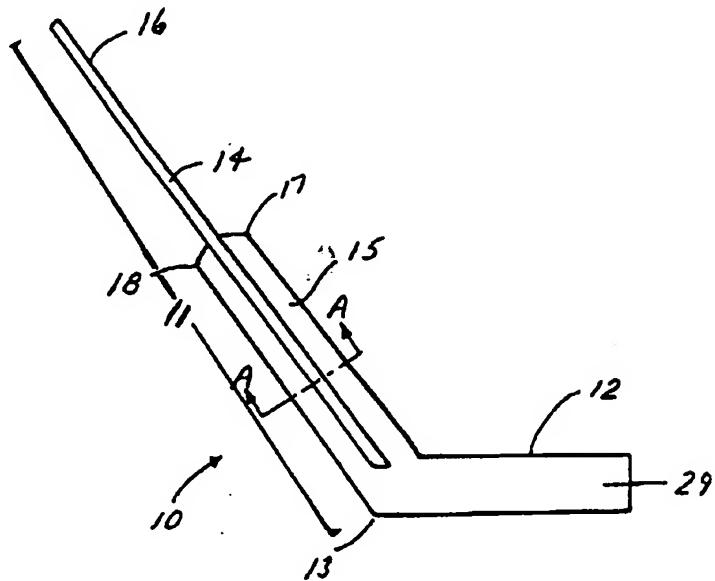
(71) CE COMPOSITES HOCKEY INC., CA

(51) Int.Cl. ⁶ A63B 59/14

(30) 1998/06/08 (09/093,369) US

**(54) BATON DE HOCKEY EN MATERIAU COMPOSITE POUR
GARDIEN DE BUT**

(54) COMPOSITE GOALKEEPER'S HOCKEY STICK



(57) A goalkeeper's polymer composite hockey stick having a blade and a shaft rigidly connected to the blade at the heel end. The shaft is comprised of two sections, the paddle and the handgrip, the handgrip extending and connecting to the paddle so as to form a unitary shaft.



COMPOSITE GOALKEEPER'S HOCKEY STICKFIELD OF THE INVENTION

5 The present invention relates generally to hockey sticks suitable for playing the sport of hockey, and particularly, to goalkeeper's hockey sticks made of polymer composite materials and which are suitable for use in ice and/or off-ice hockey.

BACKGROUND OF THE INVENTION

10 Traditionally, hockey sticks for use in ice hockey have been made of selected woods with careful attention being paid to the quality and orientation of the wood grain for each of the stick components. Developments in order to improve the stiffness and strength of the stick have included improved quality control of the woods used, lamination of the 15 shafts and the bonding of fiberglass to the outer faces of the paddle and blade sections.

20 The governing bodies of the various hockey leagues generally lay down rules for the construction of hockey sticks to be used in their leagues. For instance, the National Hockey League specifies in its rule book that no goalkeeper's hockey stick shall exceed 58 inches in length from the heel to the end of the shaft and no more than 15½ inches from the heel to the end of the blade. Furthermore, according to the rule book of this league the blade must not be more than 3½ inches in width except at the heel where it can be 4½ inches. Also all edges of the blade must be leveled and the curvature of the blade must not exceed a certain prescribed maximum. Some goalkeepers prefer 25 that the blade have no curvature at all. The wider part of the shaft, herein referred to as the paddle, must not exceed 3½ inches in width and the length of the paddle must not exceed 26 inches from the heel:

30 Certain problems arise with the use of a goalkeeper's stick constructed in the usual manner.

Not only is the goalkeeper's stick relatively heavy thereby limiting goalkeeping mobility but it is also of limited durability due to cracking, chipping or breaking. Furthermore, such construction is not suitable for off-ice hockey due to fast wearing of the bottom

surface of the blade. Finally, due to wood construction limitations it is hardly feasible to add ergonomic and/or geometric features to the goalkeeper's stick which features allow for better handling of the stick in play and of the puck thereof leading to increased control and improved goalkeeping.

5

Some of these problems arise from the fact that the narrow portion of the shaft or handgrip, which is the upper portion, extends from the center of the widened portion of the shaft or paddle. Because of this arrangement, a goalkeeper's stick will often break at the connecting point between the paddle and the handgrip.

10

SUMMARY OF THE INVENTION

The present invention overcomes the above shortcomings.

15 It is accordingly a primary objective of the present invention to provide a goalkeeper's hockey stick suitable for use in ice and/or off-ice hockey wherein the wear resistance of the stick is greater than the best goalkeeper's hockey sticks, the weight is in the lower range, or even less, of the best goalkeeper's hockey sticks, the stiffness is equivalent to or greater than the best fiber reinforced wood hockey sticks, and the breaking strength is equal to or greater than the best goalkeeper's hockey sticks.

20
25 More specifically, it is an object of the present invention to provide a goalkeeper's hockey stick which is relatively light in weight thereby improving a goalkeeper's performance, a hockey stick which does not readily chip, crack or break thereby leading to improved life cycle economics.

According to another object of the present invention, a goalkeeper's hockey stick is provided which is equally suited for use on ice and/or off-ice as the bottom surface of the blade does not readily wear off.

30

Still another object of the present invention is to provide a goalkeeper's hockey stick construction allowing for the addition of ergonomic and/or geometric features.

In accordance with another object of the present invention there is provided a hockey stick for use by a goalkeeper, comprising a blade member having a heel end, a shaft having a paddle portion connected to a handgrip portion, said paddle portion being connected to said heel end, said blade member extending to one side of the shaft, the improvement comprising a blade member, a paddle portion and a handgrip portion

5 made of polymer composite said handgrip being joined or bonded to said paddle portion.

In accordance with yet another object of the present invention there is provided a

10 hockey stick for use by a goalkeeper, comprising a blade member having a heel end, a shaft having a paddle portion connected to a handgrip portion, said paddle portion being connected to said heel end, said blade member extending to one side of the shaft, the improvement comprising a blade member and paddle portion being made of polymer composite; and a handgrip portion made of wood and fiberglass said handgrip being

15 bonded to said paddle portion.

Further objects and advantages of the present invention will be apparent from the following description, wherein preferred embodiments of the invention are clearly shown.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

The present invention will be further understood from the following description with reference to the drawings on which:

25 Figure 1 is a side view of a preferred embodiment of the invention;

Figure 2 is a cross-sectional view along lines A-A of Figure 1.

DETAILED DESCRIPTION OF THE INVENTION

30

The hockey stick 10 shown in the drawings is a hockey stick intended to be used by a goalkeeper in the game of hockey.

Referring to Figure 1, the hockey stick 10 has a generally L-shape, including a shaft 11 and a blade 12 joined at the heel end 13. The shaft 11 has two sections: a narrow handle portion or handgrip 14 and a widened portion or paddle 15.

5 The hockey stick is shaped such that the paddle 15 portion of the shaft 11 has a width substantially equal to the width of the blade 12. The handgrip 14 portion has a width less than the width of the paddle 15 portion and has a rectangular cross-section and chamfered edges 16 both at the front two edges and at the two rear edges of the shaft 11. The handgrip 14 portion of the shaft 11 connects to the paddle 15 portion of the shaft 11 midway between the front 17 top corner and the rear 18 top corner of the paddle 15 portion.

10 As can be seen in the embodiment of Figure 2, the goalkeeper's hockey stick, paddle 15 and blade 12 portions, is a composite sandwich construction consisting of a thin light weight ABS thermoplastic polymer resin core 20 with fiberglass and graphite fibre materials in an epoxy resin matrix forming the outer-surface skins 21 bonded to the ABS core 20.

15 A wood/fiberglass handgrip 14 portion is centrally bonded and/or mechanically joined to the back face of the composite sandwich construction i.e. to the paddle 15 portion. Also, all wood or all composite handgrip 14 can be used.

20 Alternatively, other thermoplastic or thermoset polymer resin cores can be used, with fiberglass or graphite by itself, or with other combinations of fibers, such as, for instance, aramid.

25 Other lightweight cores could consist of foam, honeycomb or balsa, for instance.

30 With respect to the thermoset resin, polyester or vinyl ester can be used or a thermoplastic resin such as nylon can form a matrix skin.

Prepeg materials (fibrous materials pre-impregnated with resin and partially cured as purchased) can also be used.

In an alternative embodiment, the handgrip 14 portion can be mounted centrally on the composite sandwich construction i.e. to the paddle 15 portion in such manner as to allow the handgrip 14 portion to fall flush with the outer-surface skins of said paddle 15 portion. Further, a thumbhold and/or a backlip can be added to the goalkeeper's hockey

5 stick thereby enhancing the goalkeeper's performance.

In yet another embodiment of the invention, shock absorbing means such as foam or honeycomb can be added to the front face 19 of the blade 12 and paddle 15 in order to reduce rebounds of the puck when contacting the blade 12 or paddle 15 of the

10 goalkeeper's hockey stick during play.

The playing performance of the stick is a critical aspect of the invention, and the new composition achieves results leading to better playing performance. Also, increased durability for use both on and off-ice is combined with a decrease in weight of the order of 15% thereby resulting in an overall increase in play performance.

15 The above-described embodiments provide a goalkeeper with a hockey stick that is easy and comfortable to hold and handle. Furthermore, the dimensions of the stick are not changed and as such they comply with the rules of the National Hockey League.

20

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes that 25 come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

THE EMBODIMENTS OF THE INVENTION IN WHICH AN EXCLUSIVE PROPERTY OR PRIVILEGE IS CLAIMED ARE DEFINED AS FOLLOWS:

1. A hockey stick for use by a goalkeeper, comprising a blade member having a heel end, a shaft having a paddle portion connected to a handgrip portion, said paddle portion being connected to said heel end, said blade member extending to one side of the shaft, the improvement comprising:
 - 5 a blade member, a paddle portion and a handgrip portion made of polymer composite said handgrip being bonded to said paddle portion.
- 10 2. A hockey stick for use by a goalkeeper, comprising a blade member having a heel end, a shaft having a paddle portion connected to a handgrip portion, said paddle portion being connected to said heel end, said blade member extending to one side of the shaft, the improvement comprising:
 - 15 a blade member and paddle portion being made of polymer composite; and a handgrip portion made of wood and fiberglass said handgrip being bonded to said paddle portion.
- 20 3. A hockey stick according to claim 1 or 2 wherein a thermoplastic or thermoset polymer resin core is used.
4. A goalkeeper hockey stick according to claim 1 or 2 wherein a foam or honeycomb or balsa core is used.
- 25 5. A goalkeeper hockey stick according to claim 1 or 2 wherein the handgrip portion is mounted onto the paddle in a flush fashion with the outer-surface of said paddle.
6. A goalkeeper's hockey stick according to claim 1 or 2 wherein ergonomic or geometric features are added.
- 30 7. A goalkeeper's hockey stick according to claim 6 wherein a thumbhold is formed.
8. A goalkeeper's hockey stick according to claim 6 wherein a backlip is formed.

9. A goalkeeper's hockey stick according to claim 1 or 2 wherein shock absorbing materials are added to the front face of the blade.
10. A goalkeeper's hockey stick according to claim 9 wherein the shock absorbing material is foam or honeycomb.

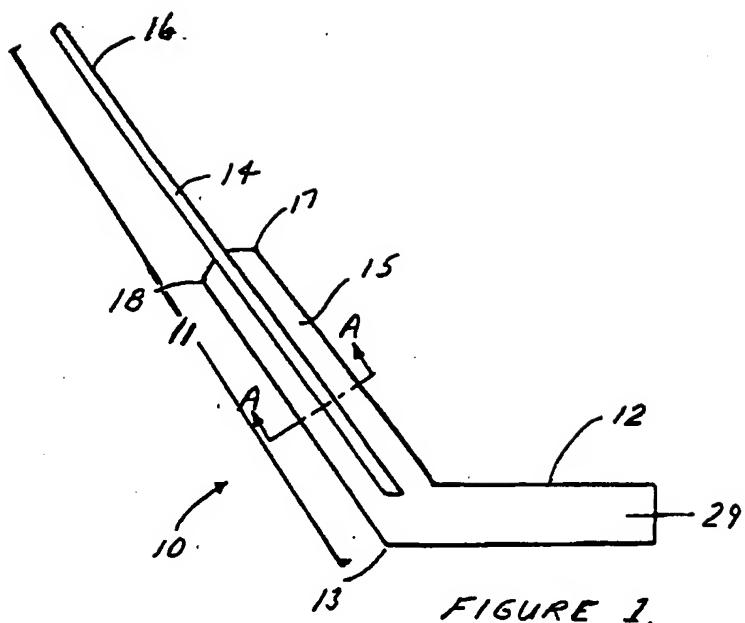


FIGURE 1.

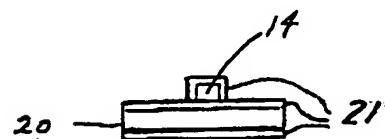


FIGURE 2.